City of Santa Clara
The Center of What's Possible

SANTA CLARA FIRE DEPARTMENT
FIRE PREVENTION & HAZARDOUS MATERIALS DIVISION
1675 Lincoln Street, Santa Clara, CA 95050
PHONE: (408) 615-4970

Elevator Landing Two-Way Communication Systems

PERMIT REQUIRED

Two-way communications systems for elevator landings require a separate permit directly with the Fire Prevention & Hazardous Materials Division. Installation, alteration, or demolition of a system shall not commence prior to the approval of plans and the issuance of a permit.

FIRE CODE EXERPTS

1. Two-way communication system shall be provided at the landing serving each elevator or bank of elevators on each accessible floor that is one or more stories above or below the level of exit discharge.

   Exceptions:
   1) Two-way communication systems are not required at the elevator landings if areas of refuges are provided.
   2) Two-way communication systems are not required on floors provided with ramps.
   3) Two-way communication systems are not required at the landings serving only freight or service elevators.

2. Two-way communication systems shall provide communication between each required location and a central control point approved by the fire department. Where the central control point (CCP) is not constantly attended, a two-way communication system shall not wait for a timed-out call to the CCP but shall ring directly to an approved monitoring location. The two-way communication system shall include both audible and visible signals.

3. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system. Signage shall comply with Chapter 11A, Section 1143A of the California Building Code requirements for visual characters.

4. Accessible emergency warning systems shall activate a means of warning the hearing impaired. Emergency warning systems as part of the fire-alarm system shall be designed and installed in accordance with NFPA 72 as amended in Chapter 80.

SUBMITTAL

1. A minimum of two sets of scaled shop quality plans and two materials data submittals submittal packages are required to be submitted for review;

2. The two-way communications systems shall be submitted under a Fire Alarm System Permit and all components shall be considered as “appliances”.

3. All installing contractors shall have a California Electrical (C-10) Contractor’s License and be familiar with the design and installation of these systems. The installing contractors shall also have a valid worker’s compensation certificate, and a Santa Clara business license. When the design and plans are produced by a party other than contractor, the plans shall be stamped by a Professional Engineer.

PLANS

Title Sheet:

1. Project name and correct address of the project.

Revision Date: 03/31/2017

2. Provide the proper level of survivability as defined by NFPA 72 under the project data.

3. Business name, address, and California Contractor's License number of the installing contractor. If the designer of the system is not the installing contractor, the following shall be clearly indicated/printed on the plans:
    a. **Designed By**: Business name, address, designer of record's full name and signature.
    b. **Installing Contractor**: Business name, address and California Contractor's License number.

4. The supervising station and UL number.

5. Occupancy group(s) of building or area as defined by the California Building Code. Number of stories, building height, and construction type.

6. Scope of work and why the system is being installed (i.e., required by the California Building Code or California Fire Code, voluntary installation, etc.).

7. A note stating that the design and installation complies with NFPA 72 (2016 edition) (if applicable), the California Electric Code (2016 edition), the California Fire Code (2016 edition), the California Building Code (2016 edition), and this standard.

8. A key plan of the building and/or complex indicating the street location and the area of work within the building shall be provided.

Floor Plans:

1. Scale used and a graphical representation of the scale. The minimum scale for plans is 1/8" = 1'-0".

2. The locations of partitions, non-rated walls, rated walls, shafts, etc. If not full height, indicate the heights of the wall and the ceiling.

3. The architectural drawing(s) stamped and signed by the Architect of Record for the construction of the rated shaft along with UL/Gypsum Association details. The architectural drawing(s) shall also include location the UL listed fire-stop through penetrations assemblies to be used for all locations (floor/ceiling assemblies and wall assemblies). NOTE: The proper "T" (for floor/ceiling assemblies only) and "F" ratings are required for the UL assemblies (See Figure #2 for examples).

4. The location of all equipment.

Riser Diagram:

1. Single-line wiring diagram (riser diagram) that shows the interconnection of each device and equipment of the whole system.

2. Number of conductors in each wiring segment and the type and size of wire or conductor to be used.

3. The class for initiating, signaling line and notification device circuits to include the circuit number or identification.

4. The locations of required fire-stop penetrations.

    NOTE: For high-rise buildings Class A wiring is required in accordance CFC 907.6.1.1 (2016 edition).

Voltage Drop Calculations & Battery Calculations:

1. The means of two-way communications shall be connected to the building power supply, and shall automatically transfer to an approved secondary power source within 10 seconds after the normal supply fails. The power source shall be capable of providing for the operation of the system (including annunciators) for one hour and the means of two-way conversation for 4-hours.

2. Batteries, or other approved secondary power sources shall have a minimum 24-hours of battery supply. Calculations shall be provided showing compliance.

3. Voltage drop calculations shall be provided to verify that the voltage drop in the two-way communication system circuits do not exceed 20-percent. Provide voltage drop calculations for each circuit.

Material Data:

1. Manufacturer's specification sheets for all equipment and materials to be used shall be submitted, including the transponder to the supervising station. Highlight on the cut sheet which device or equipment is being used, the listing information, and the application per listing.

Sequence of Operation:

1. A written description shall be provided to define the events that occur when initiating the two-way communication system. The description shall include details relating to annunciation, remote signaling, and activation of control functions, as applicable. Also provide programming description.

Equipment List:

1. Provide the model number, manufacturer's name, description, quantity, CSFM listing number, and symbols to be used (legend) for each device, equipment, and conductors proposed to be installed

   Note: The Fire Department reserves the right to disallow any listed product due to past performance.

2. The symbols used on the plans shall match the legend. Strike out any "typical" symbols that do not pertain.

3. All products and equipment shall include the manufacturer's specification sheets indicating the products proposed are IBC, NFPA and ADAAG Code Compliant. California State Fire Marshal (CSFM) listing sheets, as applicable, shall also be provided.

DESIGN AND INSTALLATION

1. Two-way communication systems shall be designed and installed in accordance California Fire Code (2016 edition), California Building Code (2016 edition), California Electrical Code (2016 edition), NFPA 72 (2016 edition), and this standard.

2. All equipment and signage shall be located directly adjacent to the elevator cab(s).

3. Two-way communication systems shall be installed within a UL or Gypsum Association 2-hour fire rated enclosure (**See Figure #2 for examples**).

   Exception: Level 1 (as defined by NFPA 72) shall be permitted where the building is less than 2-hour fire-rated construction.

4. Two-way communication systems shall provide communication between each required location and the base station unit location approved by the fire department. Typically the base station unit will be located next to the FACP. The base station shall send signals without delay (no waiting for the base station to ring) to the central station monitoring company providing 24-hour service. An approved central, proprietary or remote service, which will provide effective means of conversation for immediately summoning assistance at all hours in case of emergency, shall monitor the two-way communication system.

5. The two-way communication system shall include both audible and visible signals. A button complying with the California Building Code (2016 edition) Section 11B-407.4.9 in the elevator landings shall activate both a light in the area of refuge and/or elevator landings indicating that rescue has been requested and a light at the base station unit

indicating that rescue is being requested. A button at the base station unit shall activate both a light at the base station unit and a light in the area of refuge and/or elevator landings indicating that the request has been received (**See Figure #1 for example**).

6. Emergency two-way communication systems shall comply with Section 11B-308. The operable part of each two-way communication system initiating device (Call Box) shall be located at 48-inches above the finished floor level center to the center of the box. Tactile symbols or characters shall be white on a black background, and Braille shall be provided adjacent to the call box in accordance with Sections 11B-703.2 and 11B-703.3. Braille characters shall be located at 48-inches above the finished floor (**See Figure #1 for example**).

7. Each two-way communication system initiating device (Call Box) shall indicate its location to the FCC/Base Station and the central monitoring service.

8. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location (specific story, floor location and building address or other building identifier) shall be posted adjacent to the two-way communication system outlined in 2016 CFC 1007.8.2 (**See Figure #1 for example**).

9. There shall be no more than one two-way communication system in a building. Likewise, there shall be no more than one supervising station providing service to a building.

10. Central Station Service shall provide all the services and comply with all the requirements delineated in NFPA 72 (2016 edition). The means of two-way conversation shall be provided for no less than for 4-hours.

11. All pathways between a remote area of refuge station and the central control point (i.e. base station) shall be monitored for integrity (NFPA 72, 24.10.4). In addition the base station shall be monitored for ac-power loss, and battery failure. The fire alarm panel shall monitor the integrity of the system in compliance with NFPA 72 (2016 edition).

INSPECTIONS (These notes to be added to the drawings):

1. Field inspections shall be scheduled only after a permit has been issued.

2. Inspections shall be scheduled by the installing contractor only.

3. The installing contractor shall conduct a complete test of the system and shall complete all parts of the NFPA 72 "Record of Completion".

4. At the time of inspection, the contractor shall provide the following to the SCFD inspector upon his/her arrival:
    a. Approved and stamped plans and complete permit.
    b. As-built plans if installation has deviations from the approved plan.
    c. All previous records of inspections.

5. There shall be a minimum of two technicians. One technician will be at the two-way communication system control panel while the other will be testing the devices. Two-way radios shall be provided and the technician at the panel shall communicate to the SCFD inspector which devices are activated on the panel.

6. Necessary coordination shall be made such that representatives of other contractors whose equipment are involved in the testing are present.

7. After the successful completion of the tests/inspections, provide the following to the SCFD inspector:
    a. A copy of the Certificate of Completion from NFPA 72 and Emergency Communications Systems Supplementary Record of Inspection and Testing.
    b. The permit card for signature.

FIGURE #1: Elevator Landing Details

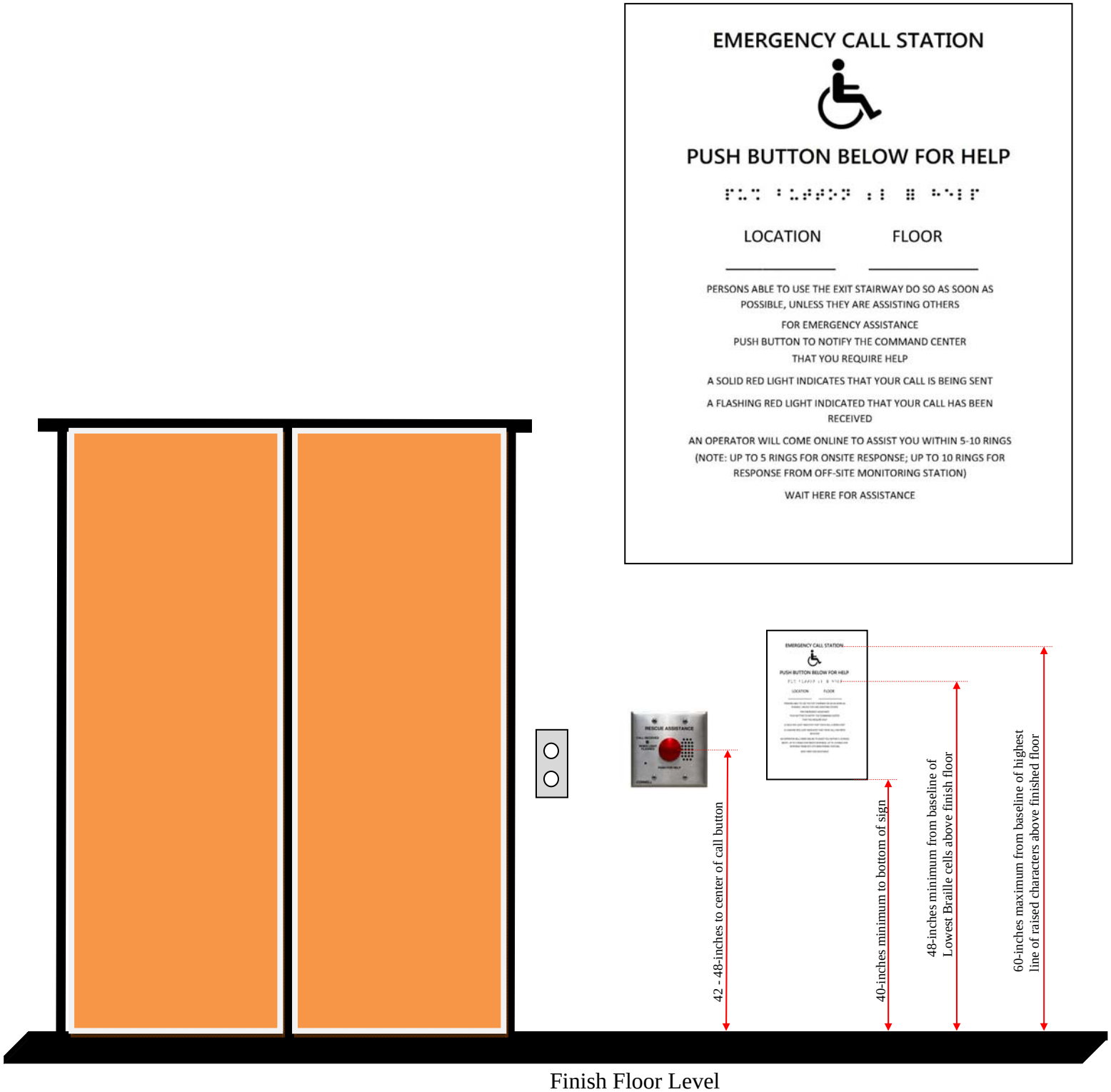
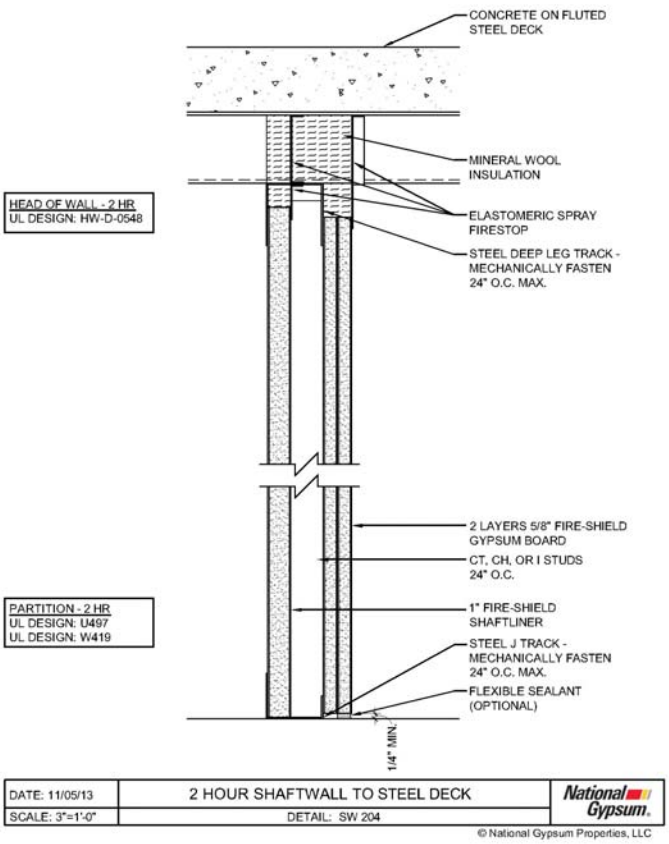
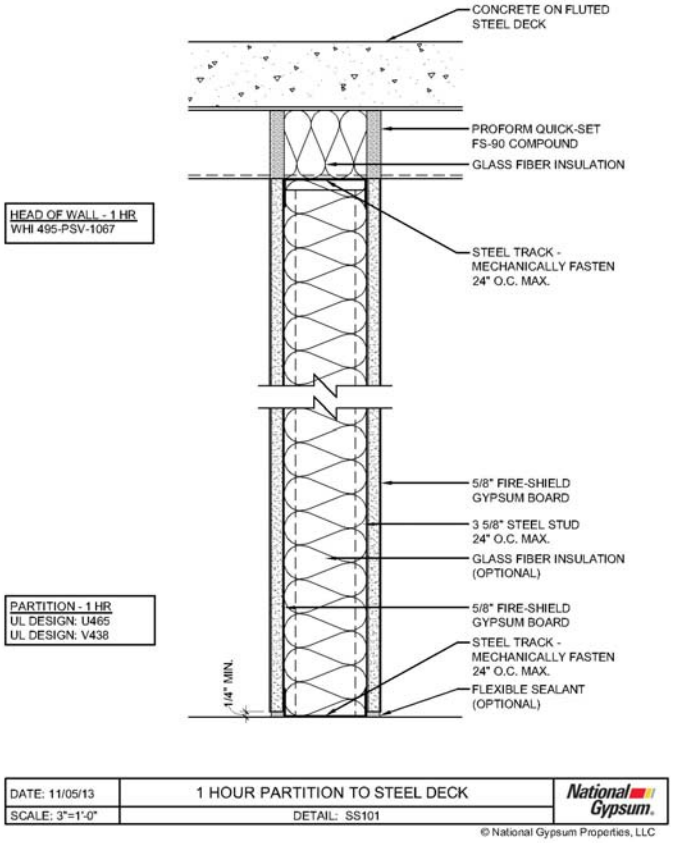
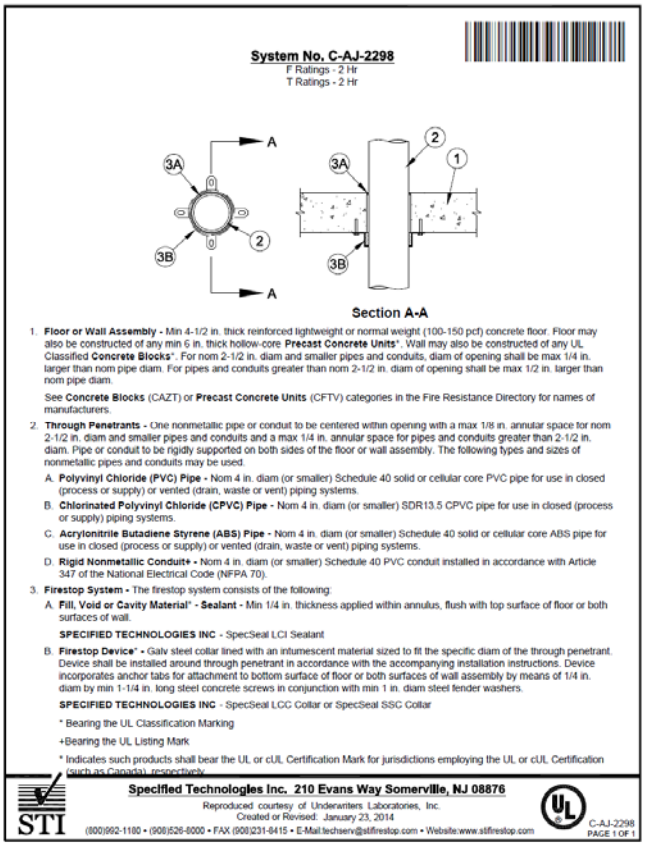


FIGURE #2: Fire Rated Construction Details (Typical)

- The construction details below are for illustration purposes only. Many other listed systems available for use depending on construction needs of the project. The details proposed to be utilized shall be cleanrly noted on the construction documents







System No. C-AJ-2298
F Ratings - 2 Hr
T Ratings - 2 Hr

1. **Floor or Wall Assembly -** Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete floor. Floor may also be constructed of any min 6 in. thick hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. For nom 2-1/2 in. diam and smaller pipes and conduits, diam of opening shall be max 1/4 in. larger than nom pipe diam. For pipes and conduits greater than nom 2-1/2 in. diam of opening shall be max 1/2 in. larger than nom pipe diam.

   See **Concrete Blocks** (CAZT) or **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Through Penetrants -** One nonmetallic pipe or conduit to be centered within opening with a max 1/8 in. annular space for nom 2-1/2 in. diam and smaller pipes and conduits and a max 1/4 in. annular space for pipes and conduits greater than 2-1/2 in. diam. Pipe or conduit to be rigidly supported on both sides of the floor or wall assembly. The following types and sizes of nonmetallic pipes and conduits may be used.
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 4 in. diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
   C. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 4 in. diam (or smaller) Schedule 40 solid or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   D. **Rigid Nonmetallic Conduit+ -** Nom 4 in. diam (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA 70).
3. **Firestop System -** The firestop system consists of the following:
   A. **Fill, Void or Cavity Material* - Sealant -** Min 1/4 in. thickness applied within annulus, flush with top surface of floor or both surfaces of wall.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCI Sealant
   B. **Firestop Device* -** Galv steel collar lined with an intumescent material sized to fit the specific diam of the through penetrant. Device shall be installed around through penetrant in accordance with the accompanying installation instructions. Device incorporates anchor tabs for attachment to bottom surface of floor or both surfaces of wall assembly by means of 1/4 in. diam by min 1-1/4 in. long steel concrete screws in conjunction with min 1 in. diam steel fender washers.

   SPECIFIED TECHNOLOGIES INC - SpecSeal LCC Collar or SpecSeal SSC Collar

   * Bearing the UL Classification Marking

   +Bearing the UL Listing Mark

   * Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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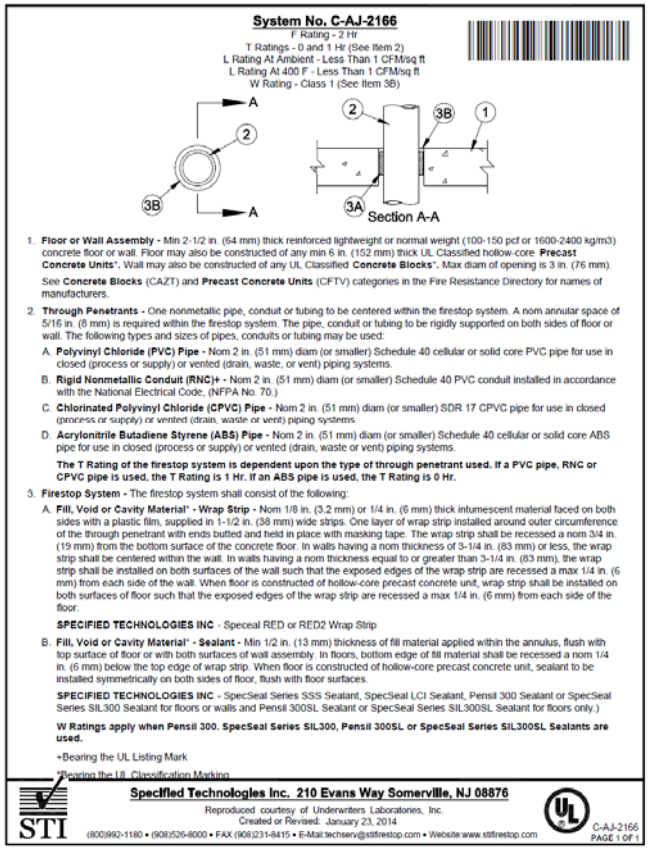

System No. C-AJ-2166
F Rating - 2 Hr
T Ratings - 0 and 1 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/sq ft
L Rating At 400 F - Less Than 1 CFM/sq ft
W Rating - Class 1 (See Item 3B)

1. **Floor or Wall Assembly -** Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete floor or wall. Floor may also be constructed of any min 6 in. (152 mm) thick UL Classified hollow-core **Precast Concrete Units***. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 3 in. (76 mm).

   See **Concrete Blocks** (CAZT) and **Precast Concrete Units** (CFTV) categories in the Fire Resistance Directory for names of manufacturers.
2. **Through Penetrants -** One nonmetallic pipe, conduit or tubing to be centered within the firestop system. A nom annular space of 5/16 in. (8 mm) is required within the firestop system. The pipe, conduit or tubing to be rigidly supported on both sides of floor or wall. The following types and sizes of pipes, conduits or tubing may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.
   B. **Rigid Nonmetallic Conduit (RNC)+ -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code, (NFPA No. 70.)
   C. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR 17 CPVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   D. **Acrylonitrile Butadiene Styrene (ABS) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

   The T Rating of the firestop system is dependent upon the type of through penetrant used. If a PVC pipe, RNC or CPVC pipe is used, the T Rating is 1 Hr. If an ABS pipe is used, the T Rating is 0 Hr.
3. **Firestop System -** The firestop system shall consist of the following:
   A. **Fill, Void or Cavity Material* - Wrap Strip -** Nom 1/8 in. (3.2 mm) or 1/4 in. (6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. One layer of wrap strip installed around outer circumference of the through penetrant with ends butted and held in place with masking tape. The wrap strip shall be recessed a nom 3/4 in. (19 mm) from the bottom surface of the concrete floor. In walls having a nom thickness of 3-1/4 in. (83 mm) or less, the wrap strip shall be centered within the wall. In walls having a nom thickness equal to or greater than 3-1/4 in. (83 mm), the wrap strip shall be installed on both surfaces of the wall such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the wall. When floor is constructed of hollow-core precast concrete unit, wrap strip shall be installed on both surfaces of floor such that the exposed edges of the wrap strip are recessed a max 1/4 in. (6 mm) from each side of the floor.

   SPECIFIED TECHNOLOGIES INC - Speceal RED or RED2 Wrap Strip
   B. **Fill, Void or Cavity Material* - Sealant -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall assembly. In floors, bottom edge of fill material shall be recessed a nom 1/4 in. (6 mm) below the top edge of wrap strip. When floor is constructed of hollow-core precast concrete unit, sealant to be installed symmetrically on both sides of floor, flush with floor surfaces.

   SPECIFIED TECHNOLOGIES INC - SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, Pensil 300 Sealant or SpecSeal Series SIL300 Sealant for floors or walls and Pensil 300SL Sealant or SpecSeal Series SIL300SL Sealant for floors only.)

   W Ratings apply when Pensil 300. SpecSeal Series SIL300, Pensil 300SL or SpecSeal Series SIL300SL Sealants are used.

   +Bearing the UL Listing Mark

   *Bearing the UL Classification Marking

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